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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,628	03/29/2004	Tapesh Yadav	A15 DIV(16)	2732

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EXAMINER
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LE, HOA T

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 08/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/811,628

Applicant(s)

YADAV ET AL.

Examiner

H. T. Le

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 4, 6, 7 and 21-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 8-20 and 33-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

### DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### *Claim Rejections - 35 USC § 112*

2. Claims 1-3, 5, 8-20, and 33-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement as applied to the rejection to claims 1-3, 5, and 8-20 set forth in the last office action and further discussed below.

2.1 Applicant contended that the specification fully complied with the written description requirement because the claimed features “at least with the ‘words’ and description” were provided in the original filing”. As stated in the last office action, mere mentioning of the claimed features (namely aspect ratio of the nanomaterial) without the teaching how the features can be achieved failed to clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed. Words in this case are not adequate because nanotechnology is not an established art.

2.2 Applicant further stated that “a general unpredictability of the art is not sufficient to state a prima facie case of lack of written description”. Contrary to Applicant’s statement, it has been held that “for inventions in an unpredictable art, an adequate written description of a genus which embraces widely variant species cannot be achieved by disclosing only one species within the genus.” Regents of University of California w. Eli Lilly, 119 F.3d 1559, 1568 (Fed. Cir. 1997). Predictability has not yet established for nanotechnology. Here, the instant claims are directed to nanomaterials, a highly unpredictable art, having unusually high

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aspect ratio (up to almost 1,000,000). Thus as held in Eli Lilly, even one working example of nanomaterial of any aspect ratio smaller than 3 (one species) would not satisfy the written description requirement for all nanomaterials having various aspect ratio up to 1,000,000 (genus), let alone a specification provides no working examples as in the instant case.

3. Claims 1-3, 5, 8-20, and 33-44 are rejected are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement as applied to the rejection to claims 1-3, 5, and 8-20 set forth in the last office action and further discussed below.

3.1 Applicant argues, "The specification does not demonstrate with a working example that chalcogenides with an aspect ratio of 1,000,000 were produced prior to the filing date of the application. However, case law and MPEP rules state as long as the specification provides considerable direction and guidance on how to practice the claimed invention (such as by related working examples) the enablement requirement is satisfied." The specification does not provide any guidance or direction as to make nanoparticles having the claimed aspect ratio. The specification provides only general discussion of nanoparticles and their applications as known in the art, but fails to describe how the claimed nanomaterial comprising chalcogenide with specific aspect ratio as claimed can be made and/or maintained. A description of what a material does, rather than what it is or how it is made, usually does not suffice as to satisfy enablement requirement as held in Enzo Biochem. Inc., v. Gen-Probe Inc., 322 F.3d 956, 963 (Fed. Cir. 2002).

3.2 In addition, Applicant cannot present the product as "novel" without describing how the product is made and expects one skilled in the art to know how to make the "novel"

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product. Without the knowledge of how such nanomaterials are made, the nanomaterials are non-existent. And application of non-existing nanomaterials would be more like a science fiction than actuality. Absence of teaching how a novel product is made is consequently an absence of enablement for that novel product.

4. Claims 1-3, 5, 33 and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement with regard to the new term “compositional uniform” as applied to the rejection to claims 1-3 and 5 set forth in the last office action and further discussed below.

As stated in the last office action, claims 1-3 were amended to limit to “compositionally uniform” nanomaterial. However, no support for “compositional uniform” can be found in the originally filed specification. Further, there is no definition as to what constitutes “compositionally uniform”. Applicant alleged that support for such terminology is demonstrated at paragraphs [102] and [103]. Paragraph [0103] gives example of Bi<sub>2</sub>Te<sub>3</sub> and Bi<sub>2</sub>Se<sub>3</sub> as chalcogenide nanofillers. There’s nothing in these paragraphs to identify or suggest that these nanofillers are of aspect ratio and/or compositionally uniform. Accordingly, newly submitted claims 33 and 34 are rejected for the same reasons.

#### ***Claim Rejections - 35 USC § 102***

***Examiner’s Notes:*** Newly submitted claims 33-44 contain the same limitations of claims 1-3, 5 and 8-20 because the aspect ratio of the nanomaterial recited in claims 33-44 is within the range of the aspect ratio recited in claims 1-3, 5 and 8-20. Therefore, claims 33-44 are

rejected based on the same references for the same reasoning applied in the rejections to claims 1-3, 5 and 8-20 set forth the last office action.

5. Claims 1-3, 5, 8-20 and 33-44 are rejected under 35 U.S.C. 102(a) or (b) as being anticipated by the Schooman article (“nanostructured materials in solid state ionics”) as applied to the rejection to claims 1, 3, 5, 15 and 18-20 set forth in the last office action and further discussed below.

5.1 Applicant argues that ancient Mayan samples mentioned by Schooman are acknowledged by Schooman to be the Jose-Yacaman article, and the material discussed in the Jose-Yacaman article does not contain chalcogenide. Note that, as stated in the last office action, besides the ancient material, Schooman also discusses chalcogenide nanomaterial, inorganic nanomaterial, and polymeric nanomaterial dating back to the 70's. See page 6, left column, first paragraph, and pages 6-7, under the section “History of nanostructured materials”. Therefore, the nanomaterials taught in the Schooman article include chalcogenides.

6. Claims 1, 3, 5, 16, 18-20 and 33-44 are rejected under 35 U.S.C. 102 (b) as being anticipated by the Xin article (“Formation of self-assembling CdSe quantum dots on ZnSe by molecular beam epitaxy”) as applied to the rejection to claims 1, 3, 5, 15 and 18-20 set forth in the last office action and further discussed below.

6.1 Applicant argues that the nanomaterial taught by Xin is “compositionally non-uniform”. The grown layer comprising quantum dots of CdSe. Each quantum dot has an aspect ratio of 4. Note that the description of the aspect ratio of 4 is referred to “uncapped

CdSe” quantum dots. Therefore, the nanomaterial taught by Xin is compositionally uniform. Furthermore, claims 16, 18-20 and 35-44 contain no limitation of “compositionally uniform”.

7. Claims 8-13, 16-20 and 33-44 are rejected under 35 U.S.C. 102 (a) or (b) as being anticipated by various articles as applied to the rejection to claims 8-13 and 16-20 set forth in the last office action and further discussed below.

7.1 Applicant argues that the Margrave, Kian Ping Loh and Lee-and-Chen articles are not valid prior art because they were published after the “priority date” of the instant application. The present applications is not entitled to the cited priority date because none of the presently claimed products as recited in instant claims were disclosed in the patent applications.

### ***Conclusion***

8. Applicant's arguments filed April 21, 2006 have been fully considered but they are not persuasive for the reasons set forth above. However, the arguments have been effective to overcome the rejections based on the Jose-Yacaman article and the Chiang article.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened

statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 10:00 a.m. to 6:30 p.m., Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



H. T. Le  
Primary Examiner  
Art Unit 1773

July 10, 2006